

# Salt River Subbasin TMDL Implementation Plan for Agriculture



Photo taken from DEQ, Salt River Subbasin Assessment and Total Maximum Daily Loads, 2018

(17040105)

Prepared by the Idaho Soil and Water Conservation Commission  
In cooperation with the Caribou Soil Conservation District, East Side Soil  
and Water Conservation District, and U.S. Department of Agriculture –  
Natural Resources Conservation Service

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## Introduction

The purpose of this plan is to assist local stakeholders in restoring beneficial uses within the Salt River Subbasin.

Pursuant to section 39-3601 et seq., Idaho Code, and IDAPA 58.01.02, Water Quality Standards, the Idaho Soil & Water Conservation Commission (ISWCC) is the designated agency for the management of nonpoint source pollution on grazing and agricultural land in Idaho and is therefore responsible to lead Total Maximum Daily Load (TMDL) implementation activities on grazing and agricultural land in the State.

The overall goal of this Implementation Plan is to help restore designated beneficial uses on impaired waterbodies by providing a framework that local stakeholders can use to reach the goals established in the TMDL. This Plan provides details of Best Management Practices (BMPs) needed to achieve load reductions, outlines an adaptive management approach and schedule of these actions, and specifies monitoring needed to document actions and progress toward meeting water quality standards.

The major objective of this plan is to address impaired waterbodies within the Salt River Subbasin Assessment and Total Maximum Daily Loads (DEQ, 2018), pollutants from agricultural sources, and a plan to reduce pollutant loads through the implementation of BMPs. Another objective is to outline a process by which BMP implementation and effectiveness will be monitored and the implementation plan revised, if needed.



Photo taken from DEQ, Salt River Subbasin Assessment and Total Maximum Daily Loads, 2018

## Overview of Subbasin Characteristics

**Table 1: Summary of Subbasin Characteristics**

Hydrologic Unit Code .....	17040105
States .....	Idaho and Wyoming
<u>Subbasin Characteristics within Idaho</u>	
Area .....	891 mi <sup>2</sup> Total (414 mi <sup>2</sup> in Idaho)
Elevations .....	5,600 ft to 8,500 ft
Climate .....	Warm Summers and Cold Winters
Precipitation .....	21-41 inches
Water Quality Limited Assessment Units .....	17 AUs for which TMDLs were Developed.
Pollutants of Concern identified in the Salt River Subbasin Assessment and TMDL's from Ag. Sources ....	
<ul style="list-style-type: none"> <li>▪ E. coli/fecal coliforms</li> <li>▪ Sediment</li> </ul>	
Beneficial Uses Affected .....	
<ul style="list-style-type: none"> <li>▪ Cold Water Aquatic Life</li> <li>▪ Secondary Contact Recreation</li> <li>▪ Salmonid Spawning</li> </ul>	
Land Uses .....	
<ul style="list-style-type: none"> <li>▪ Mining</li> <li>▪ Recreation</li> <li>▪ Livestock Grazing</li> <li>▪ Agriculture</li> </ul>	
Nonpoint Pollutant Sources .....	
<ul style="list-style-type: none"> <li>▪ Agricultural production and associated erosion</li> <li>▪ Livestock or wildlife defecating in or nearby waterbodies</li> <li>▪ Accelerated streambank erosion associated with riparian grazing</li> <li>▪ Mining</li> <li>▪ Roads</li> </ul>	

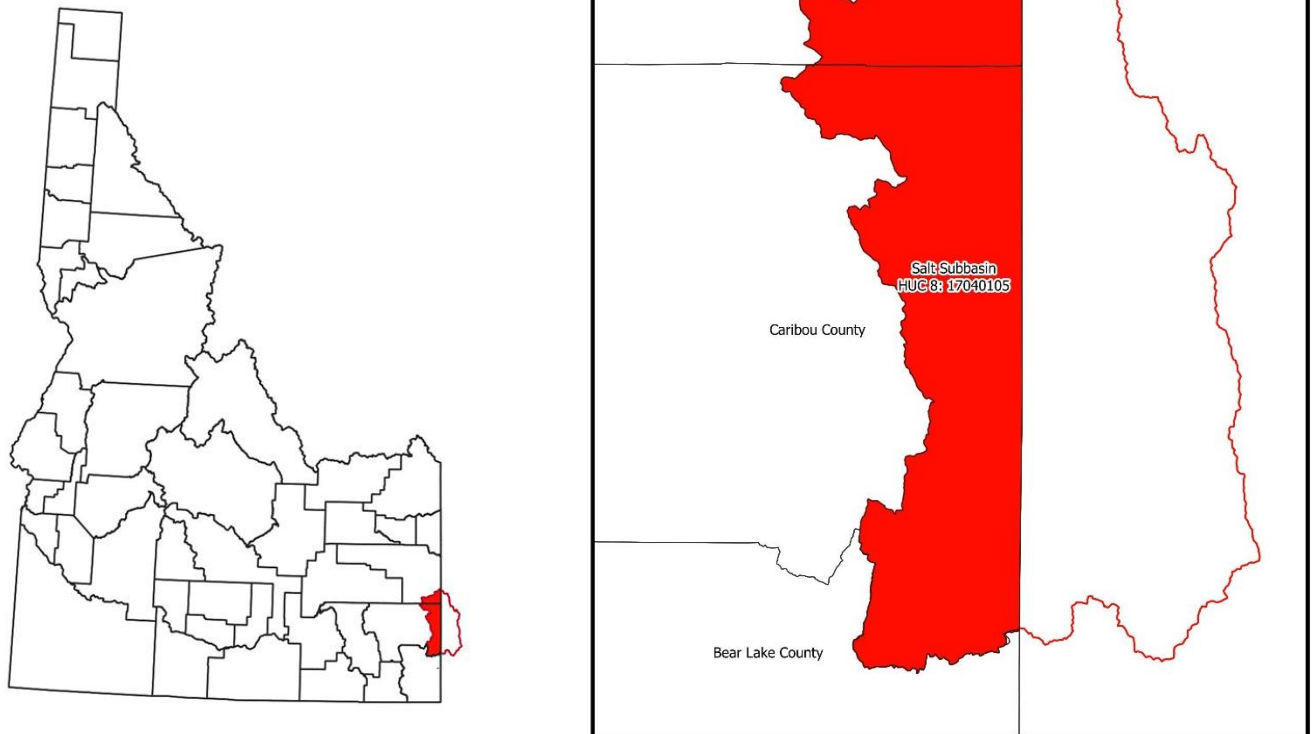
(DEQ, 2018)

## Location

The Salt River Subbasin located in Southeast Idaho and Central Western Wyoming, bisected by the state border. The subbasin drains the east side of the Caribou Mountains and flows north through Wyoming, returning to Idaho at Palisades Reservoir, which acts as the conflux with the Snake River. Within Idaho, the Subbasin is located in the southeastern corner of Bonneville County and the eastern edge of Caribou County, bordering Bear Lake County to the south (DEQ, 2018), see

Figure 1.

Figure 1: Location Map



## Land Ownership

The majority of the subbasin is publicly owned land consisting of approximately 80.2% managed by the U.S. Forest Service, 1.8% by the Bureau of Land Management, and 0.4 % by the State of Idaho. Approximately 46,576 acres or 17.3 % of the subbasin (within Idaho) is privately owned. Of these privately owned lands, mining interests own approximately 28.6%, leaving approximately 32,800 acres of private land, which is primarily utilized for agriculture and rangeland (see Figure 2)

## Land Use/Land Cover

Land uses within the basin include mining, livestock grazing, agriculture, and recreation. The land cover with the subbasin is dominated by Forestland (53%), Scrub/Shrub Vegetation (35%), and Grassland/Herbaceous Vegetation (9%). This plan will focus on the private lands primarily used for grazing and agriculture.

## Private Lands

Of the private land not owned by mining interests, agricultural land estimates are 1,500 acres of cultivated cropland and 1,700 acres of pasture and hayland primarily in the northeastern portion of the subbasin, near Freedom, WY. Grazing lands incorporate a majority of the remaining privately-owned lands, including; approximately 6,500 acres of forestland, 5,200 acres of Grassland/Herbaceous cover, and 16,200 acres of lands with Scrub/Shrub cover (see Figure 3).

## Land Use Trends

Long-term trends in land use will depend on mining expansions or contractions, urban growth, and development of communities located in Lincoln County, Wyoming, such as Freedom and Afton. Lincoln County had a population of just over 18,000 as of the 2010 census and was estimated to grow 7.7% by 2018, which is slightly greater than the 7.3% increase Caribou County, ID was expected to experience (U.S. Census Bureau, 2019). Conversion of traditionally agricultural and grazing lands to rural-residential and other developed land uses have already occurred and are expected to continue as populations in nearby communities continue to grow. However, due to the rural nature of the subbasin, large portions of public lands, and the limited private landownership; land uses at the subbasin sale are likely to remain relatively unchanged.



Figure 2: Land Management

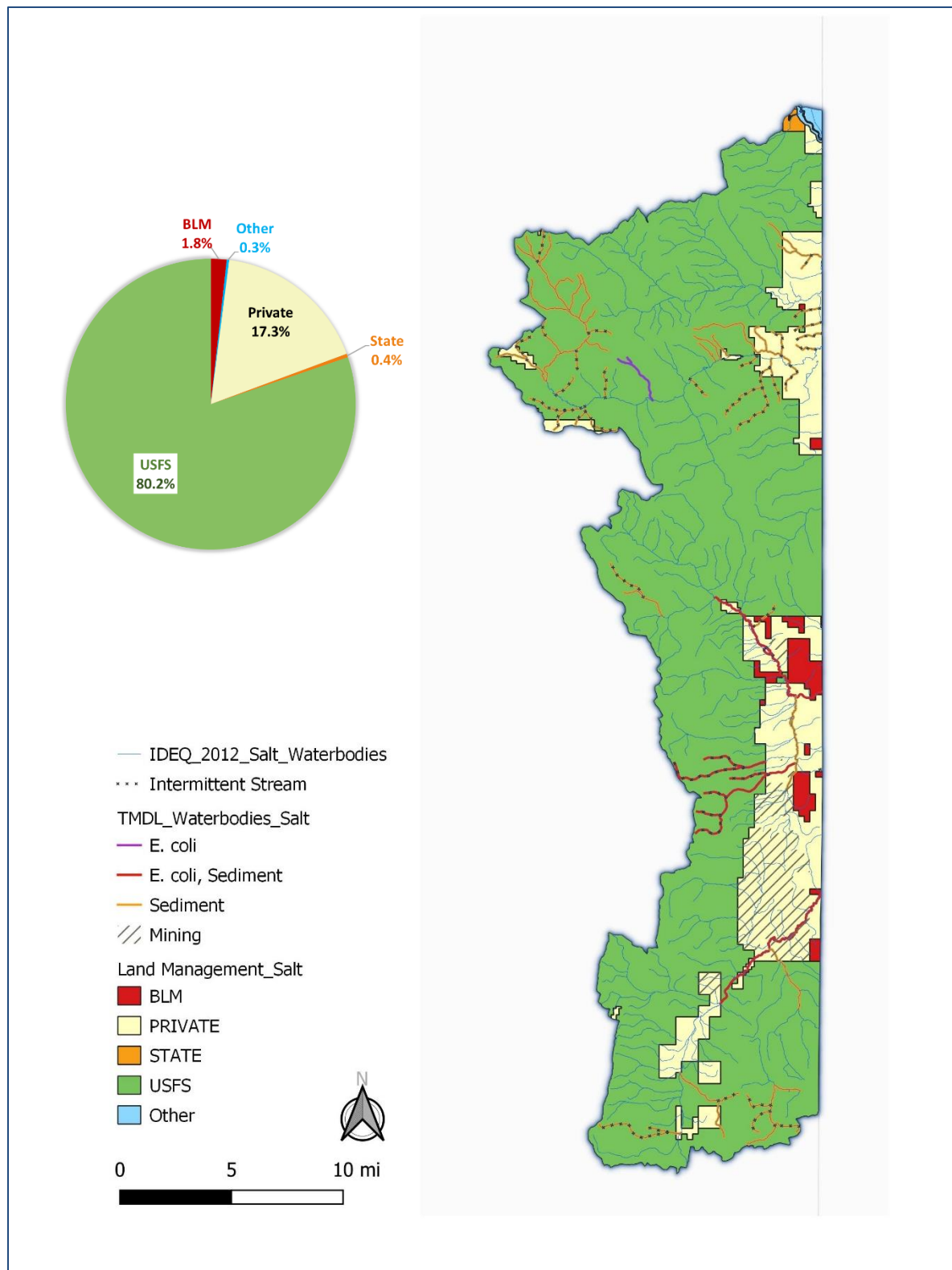
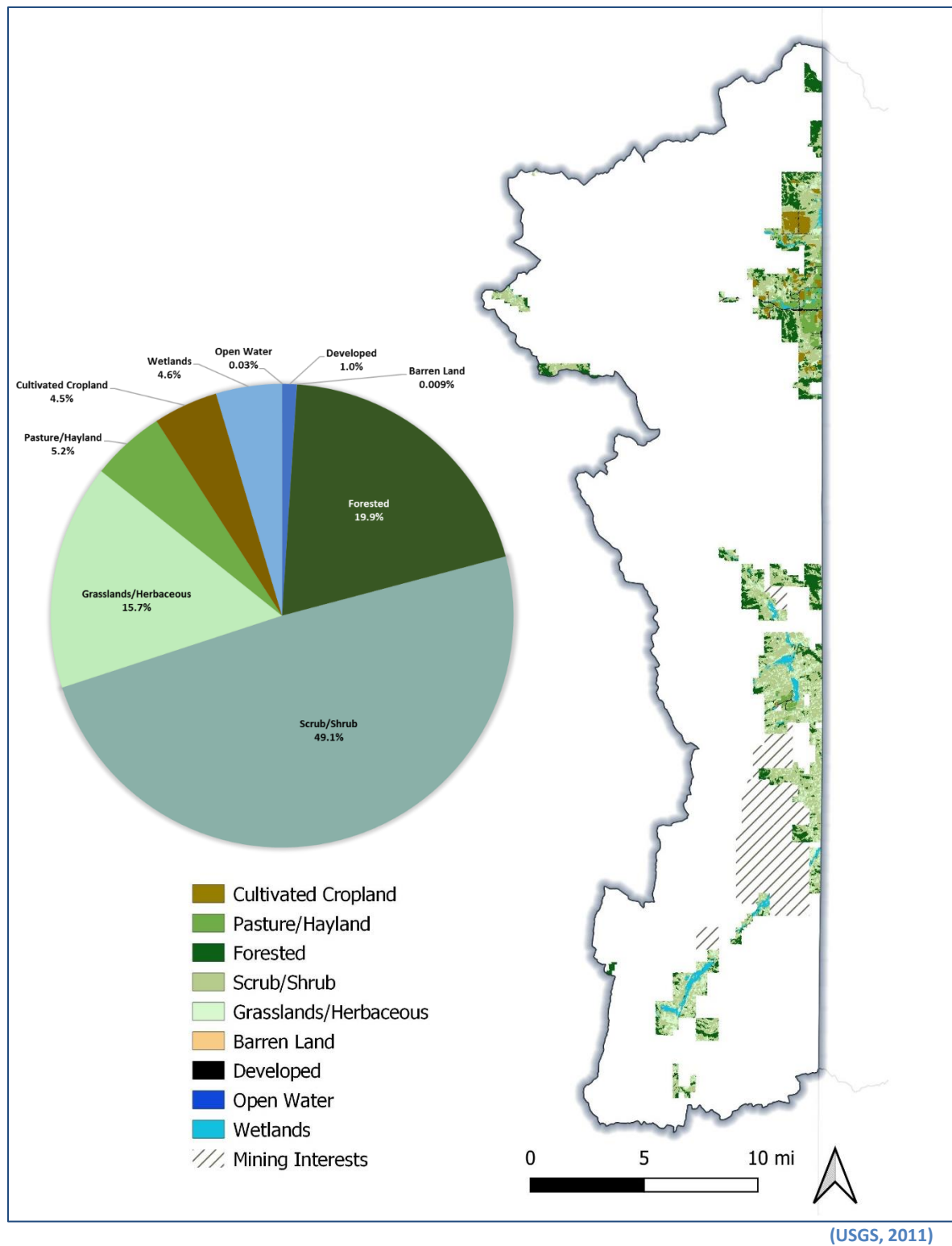


Figure 3: Land Cover on Private Lands, not including Mining Interests



## Accomplishments

The USDA – Natural Resources Conservation Service (NRCS), USDA-Farm Service Agency (FSA), Idaho Soil and Water Conservation Commission (ISWCC), local Soil and Water Conservation Districts (SWCDs), U.S. Forest Service, and NGOs work with private landowners to implement voluntary conservation within the Subbasin on a variety of projects involving conservation planning and implementing Best Management Practices (BMPs). Table 2 **Error! Reference source not found.** contains a summary of the documented conservation activities and practices (along with USDA practice code #'s) that were implemented by private landowners, NRCS, FSA, ISWCC, SWCDs, and others between 2001 and 2018 on private agricultural lands in the Subbasin.

**Table 2: Summary of Identified BMP's Implemented within the Subbasin by Land Use, 2001-2018.**

<i>Practice Name (NRCS Code)</i>	<i>Cropland</i>	<i>Pasture</i>	<i>Rangeland</i>	<i>Other Land Use</i>
<i>Access Control (472)</i>		1 ac.		
<i>Aquatic Organism Passage (396)</i>		1 mi.		
<i>Channel Bank Vegetation (322)</i>		1 ac.		
<i>Channel Bed Stabilization (584)</i>	550 ft.			56 ft.
<i>Comprehensive Nutrient Management Plan (100)</i>		1 #		
<i>Conservation Crop Rotation (328)</i>	120.2 ac.			
<i>Critical Area Planting (342)</i>		2 ac.		
<i>Fence (382)</i>	4273 ft.	3830 ft.		
<i>Forage Harvest Management (511)</i>	62.8 ac.			
<i>Grade Stabilization Structure (410)</i>	5 #			
<i>Heavy Use Area Protection (561)</i>	0.3 ac.			
<i>Herbaceous Weed Treatment (315)</i>	23.1 ac.	13 ac.		5.4 ac.
<i>Irrigation Pipeline (430)</i>	6438 ft.			1,981 ft.
<i>Irrigation Water Management (449)</i>	273 ac.			
<i>Livestock Pipeline (516)</i>	2130 ft.	940 ft.		356 ft.
<i>Nutrient Management (590)</i>	520 ac.			
<i>Pest Management Conservation System (595)</i>	411 ac.	338.9 ac.	90 ac.	10.8 ac.
<i>Prescribed Grazing (528)</i>	186 ac.	124.1 ac.	90 ac.	
<i>Pumping Plant (533)</i>	2 #	1 #		
<i>Spring Development (574)</i>	2 #			
<i>Sprinkler System (442)</i>	155.7 ac.	25.7 ac.		
<i>Streambank and Shoreline Protection (580)</i>	370 ft.	800 ft.		46 ft.
<i>Structure for Water Control (587)</i>	2 #	1 #		2 #
<i>Tree/Shrub Establishment (612)</i>		1 ac.		
<i>Water Well (642)</i>				1 #
<i>Watering Facility (614)</i>	3 #			1 #
<i>Wetland Wildlife Habitat Management (644)</i>		4 ac.		

## Pollutants of Concern

### Sediment

Agriculture is a major source of accelerated soil erosion and sediment loading of waterbodies on private land not associated with mining interests within the Salt Subbasin. Of the 32,800 acres of private land that is not owned by mining interests, approximately 87% is rangeland (scrub/shrub, forested, and grassland) and pasture utilized for grazing livestock and 4.5 % is cultivated for agriculture crop production (USGS, 2011).

A large source of erosion and sediment loading from private lands is influenced by agriculture and livestock grazing practices.

*“Much of the subbasin is grazed by cattle and sheep on public and private lands, which can lead to increased bank erosion. Agriculture mostly hay production, on private land in valleys of the subbasin may contribute excess sediment to streams through field erosion. Further, roads and trails in the subbasin, especially streamside, may contribute additional sediment to streams. Stormwater runoff may pick up pollutants from agricultural and other nonpoint source activities in the watershed and transport it untreated into waterbodies” (DEQ, Salt River Subbasin Assessment and Total Maximum Daily Loads, 2018, p. 45).*

Impaired waterbodies segments, identified pollutants, waterbody type, and private landownership are shown below on Figures 4-7 and Tables 3-6. Current pollutant loads, load allocations, and necessary reductions are shown below in Table 7 and the sediment targets for Salmonid Spawning Habitat are listed in

Table 8.

### *E. coli*

Livestock and wildlife defecating in waterbodies and nearby runoff areas are identified as the primary sources of *E. coli* loads.

*“E. coli is an intestinal bacterium common to warm-blooded animals. Both livestock and wildlife contribute E. coli to streams by defecating in and near water. Elevated E. coli levels are often associated with riparian grazing and related streambank erosion” (DEQ, Salt River Subbasin Assessment and Total Maximum Daily Loads, 2018, p. 45).*

Impaired waterbodies segments, identified pollutants, waterbody type, and private land ownership are shown below on Figures 4-7 and Tables 3-6. Current pollutant loads, load allocations, and necessary reductions are shown below in Table 7.

Figure 4: 303(d) Listed Waterbodies – Private Land, Northwest Salt Watershed

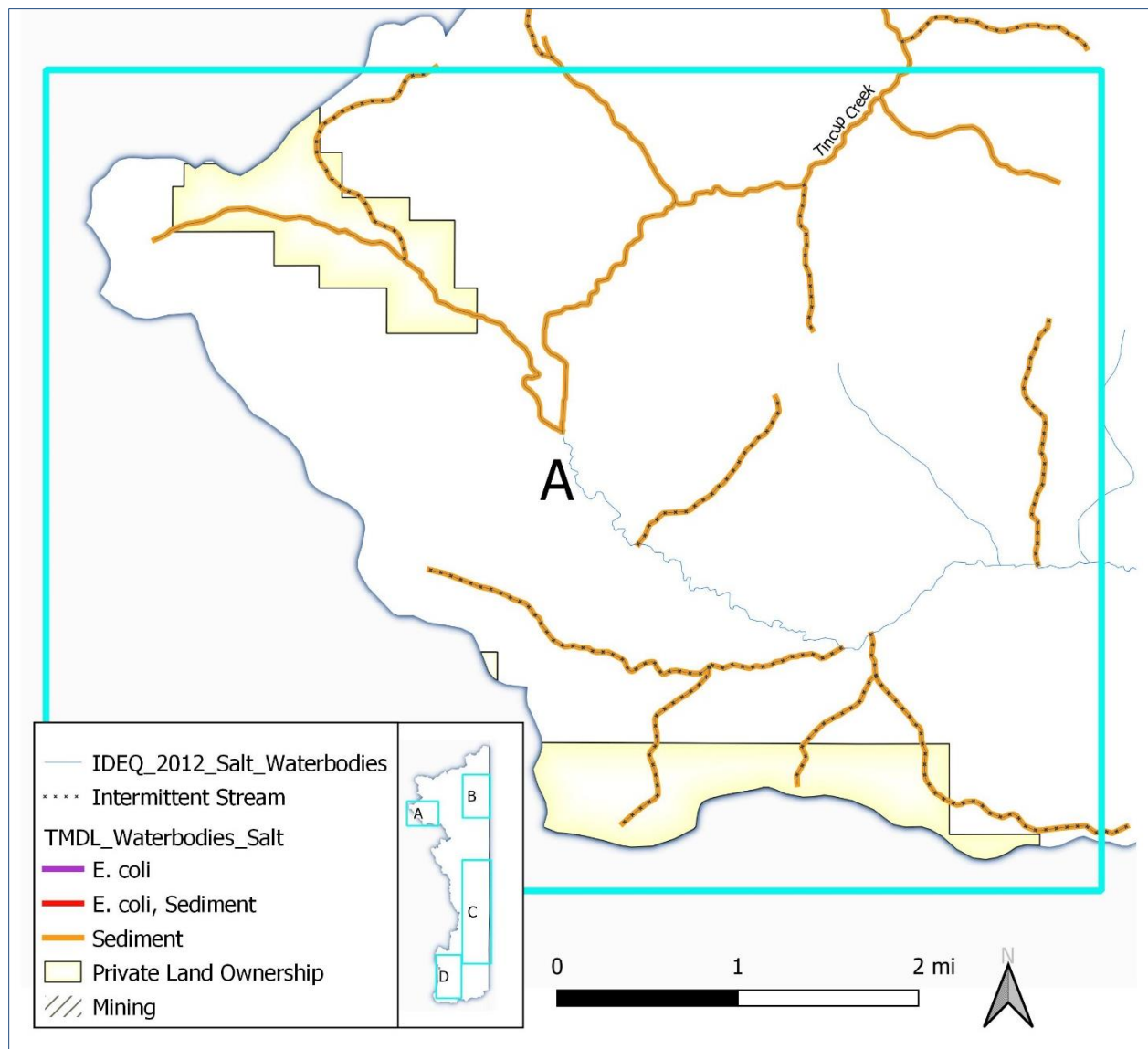


Table 3: 303(d) Waterbodies/Pollutants of Concern – Private land, Northwest Salt Watershed

ASSESSMENT UNIT	WATERBODY	TYPE	POLLUTANT
ID17040105SK003_02	Tincup Creek - Tributaries	Intermittent Stream	Sediment
ID17040105SK003_02	Tincup Creek - Tributaries	Perennial Stream	Sediment

Figure 5: 303(d) Listed Waterbodies – Private Land, Northeast Salt Watershed

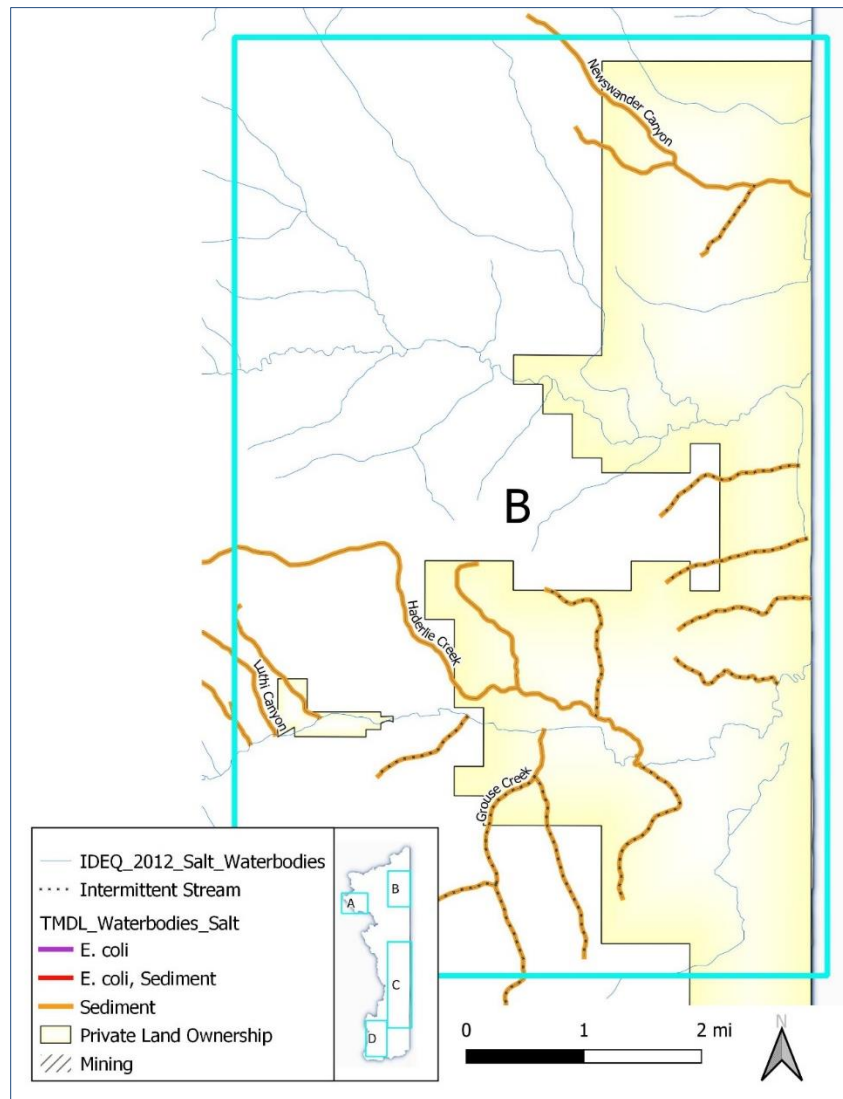


Table 4: 303(d) Waterbodies/Pollutants of Concern – Private land, Northeast Salt Watershed

ASSESSMENT UNIT	WATERBODY	TYPE	POLLUTANT
ID17040105SK003_02	Tincup Creek Tributaries	Intermittent Stream	Sediment
ID17040105SK003_02	Tincup Creek Tributaries	Perennial Stream	Sediment
ID17040105SK001_02b	Newwander Canyon	Perennial Stream	Sediment
ID17040105SK001_02b	Newwander Canyon	Intermittent Stream	Sediment
ID17040105SK003_02j	Haderlie Creek	Perennial Stream	Sediment
ID17040105SK003_02j	Haderlie Creek	Intermittent Stream	Sediment
ID17040105SK003_02i	Luthi Canyon	Perennial Stream	Sediment
ID17040105SK003_02	Grouse Creek	Intermittent Stream	Sediment
ID17040105SK003_02	Grouse Creek	Perennial Stream	Sediment



Figure 6: 303(d) Listed Waterbodies – Private Land, Central Salt Watershed

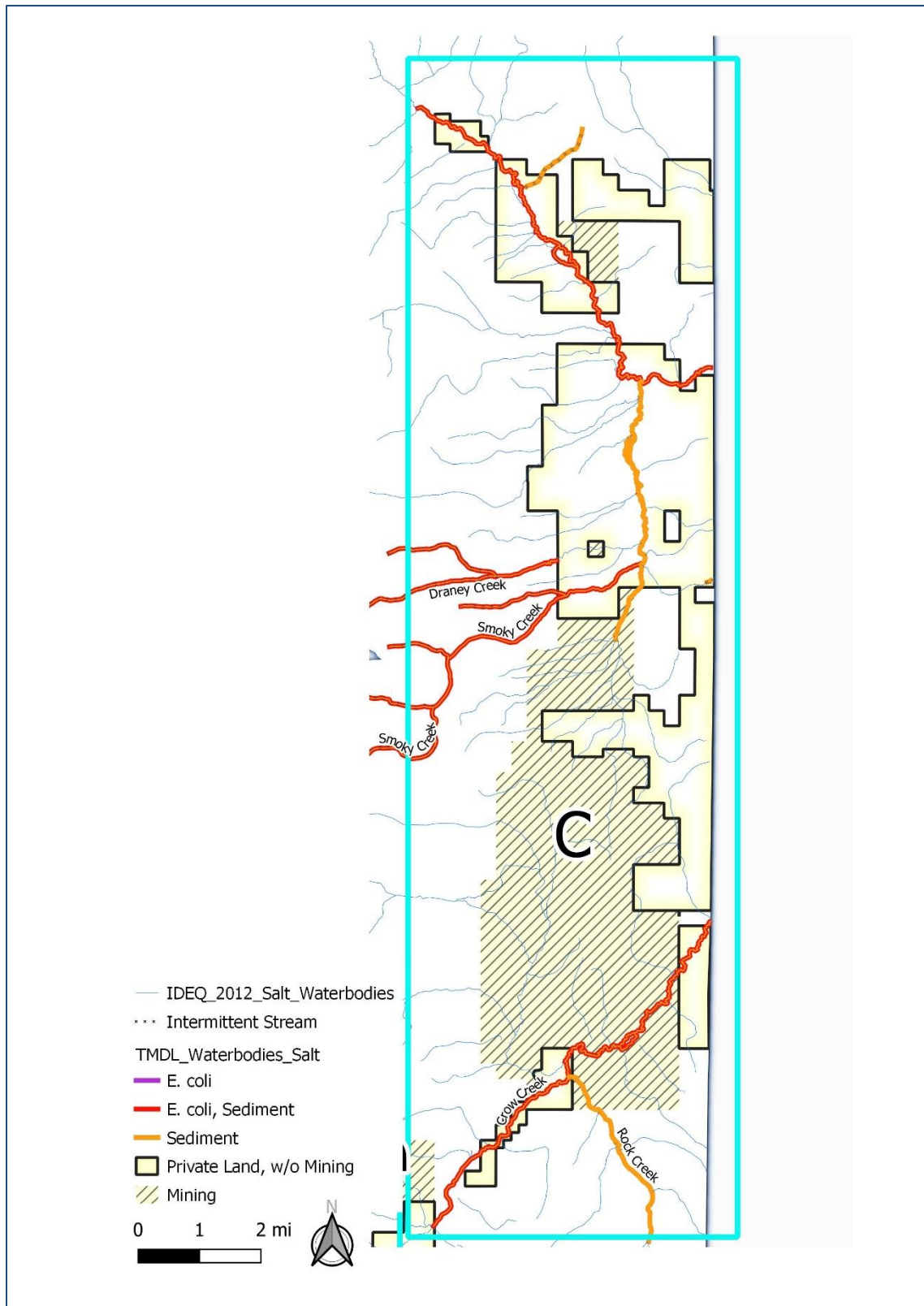


Table 5: 303(d) waterbodies/pollutants of concern – private land, central Salt Watershed

<i>ASSESSMENT UNIT</i>	<i>WATERBODY</i>	<i>TYPE</i>	<i>POLLUTANT</i>
<i>ID17040105SK008_02c</i>	Beaver Dam Creek	Perennial Stream	Sediment
<i>ID17040105SK008_04</i>	Crow Creek	Perennial Stream	<i>E. coli</i> , Sediment
<i>ID17040105SK011_03</i>	Rock Creek	Perennial Stream	Sediment
<i>ID17040105SK007_02c</i>	Smoky Creek	Perennial Stream	<i>E. coli</i> , Sediment
<i>ID17040105SK007_02c</i>	Smoky Creek Tributary	Intermittent Stream	<i>E. coli</i> , Sediment
<i>ID17040105SK006_04</i>	Stump Creek	Perennial Stream	<i>E. coli</i> , Sediment
<i>ID17040105SK006_04</i>	Stump Creek Tributaries	Intermittent Stream	<i>E. coli</i> , Sediment
<i>ID17040105SK006_02g</i>	Stump Creek Trib. / Graehl Canyon	Intermittent Stream	Sediment
<i>ID17040105SK007_03</i>	Tygee Creek	Perennial Stream	Sediment



Figure 7: 303(d) listed waterbodies – private land, southwest Salt Watershed

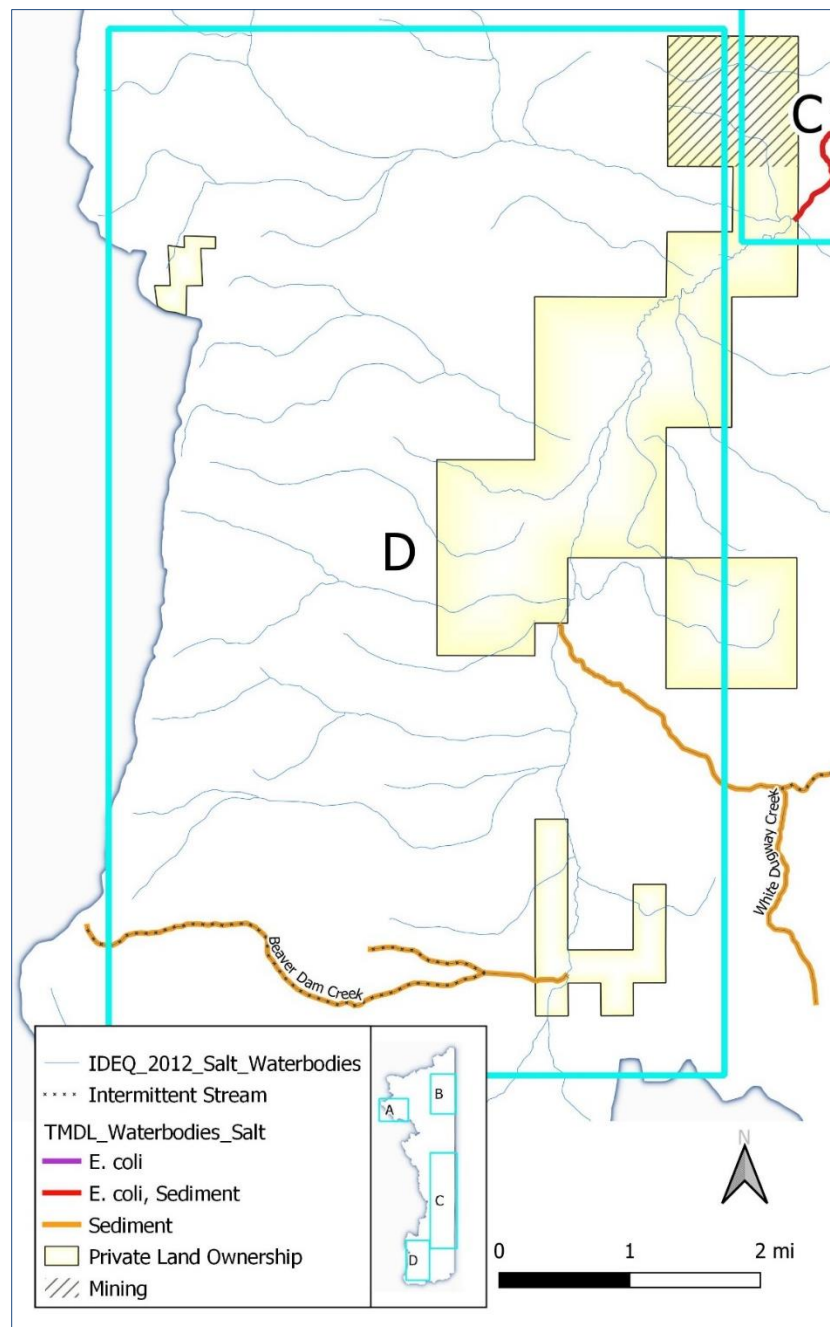


Table 6: 303(d) waterbodies/pollutants of concern – private land, southwest salt watershed

ASSESSMENT UNIT	WATERBODY	TYPE	POLLUTANT
ID17040105SK008_04	Crow Creek	Perennial Stream	<i>E. coli</i> , Sediment
ID17040105SK008_02c	Beaver Dam Creek	Perennial Stream	Sediment

## Current Loads, Load Allocations, and Necessary Reductions

Table 7: Current and target loads w/ % necessary reduction on private agricultural and rangeland

ASSESSMENT UNIT	WATERBODY	POLLUTANT	CURRENT LOAD	TARGET LOAD	LOAD REDUCTION %
ID17040105SK001_02b	Newswander Canyon	Sediment	66.3 tons/yr.	27.8 tons/yr.	58
ID17040105SK003_02	Tincup Creek / Grouse Creek /Trib.	Sediment	230 tons/yr.	118 tons/yr.	49
ID17040105SK003_02i	Luthi Canyon	Sediment	55.8 tons/yr.	44.7 tons/yr.	20
ID17040105SK003_02j	Haderlie Creek	Sediment	41.5 tons/yr.	40.2 tons/yr.	3
ID17040105SK006_02g	Stump Creek Trib./Graehl Canyon	Sediment	17.4 tons/yr.	6.93 tons/yr.	60
ID17040105SK006_04	Lower Stump Creek	<i>E. coli</i>	454 cfu/100mL	126 cfu/100mL	72
ID17040105SK006_04	Lower Stump Creek	Sediment	535 ton/yr.	283 tons/yr.	47
ID17040105SK007_02c	Smoky Creek	<i>E. coli</i>	1060 cfu/100mL	126 cfu/100mL	88
ID17040105SK007_02c	Smoky Creek	Sediment	256 tons/yr.	56.9 tons/yr.	78
ID17040105SK007_03	Tygee Creek	Sediment	1010 tons/yr.	450 tons/yr.	55
ID17040105SK008_02c	Beaver Dam Creek	Sediment	70.6 tons/yr.	17.1 tons/yr.	76
ID17040105SK008_04	Crow Creek	<i>E. coli</i>	579 cfu/100mL	126 cfu/100mL	78
ID17040105SK008_04	Crow Creek	Sediment	107.2 tons/yr.	98.8 tons/yr.	16
ID17040105SK011_03	Rock Creek	Sediment	57.35 tons/yr. overall (224 in USFS reach)	88.9 tons/yr.	64

(DEQ, Salt River Subbasin Assessment and Total Maximum Daily Loads, 2018, pp. 54-55)

Table 8: Current and target fine subsurface sediment in salmonid spawning habitat on private agricultural and rangeland

ASSESSMENT UNIT	WATERBODY	Current % Fines <6.25 mm	Target % Fines <6.25 mm	Current % Fines < 0.85 mm	Target % Fines <0.85 mm
ID17040105SK006_04	Lower Stump Creek	41.8	27	12.3	10
ID17040105SK008_04	Crow Creek	38.5	27	12.7	10
ID17040105SK011_03	Rock Creek	45	27	23.4	10

(DEQ, Salt River Subbasin Assessment and Total Maximum Daily Loads, 2018, p. 56)

## Treatments

### Sediment

Sediment entering surface waters from agricultural land uses can be minimized, eliminated, or mitigated through the implementation of agricultural BMPs. BMPs such as riparian fencing, off-stream livestock watering systems, and grazing management can be effective in reducing streambank destabilization and other riparian impacts from livestock. No-till, cover crops, and other soil health practices have been shown to greatly improve soil infiltration and other soil functions, thus reducing excessive anthropogenic soil erosion.

**Table 9: BMPs and Practice Codes identified by NRCS as moderately to substantially effective for reducing soil erosion and sediment transported to surface waters**

- Access Control -472
- Alley Cropping-311
- Anionic Polyacrylamide (PAM) Erosion Control-450
- Conservation Cover-327
- Conservation Crop Rotation-328
- Constructed Wetland-656
- Contour Buffer Strips-332
- Contour Orchard and Other Perennial Crops-331
- Cover Crop-340
- Critical Area Planting-342
- Cross Wind Ridges-588
- Cross Wind Trap Strips-589C
- Field Border-386
- Field Operations Emissions Reduction-376
- Filter Strip-393
- Grassed Waterway-412
- Herbaceous Wind Barriers-603
- Karst Sinkhole Treatment -527
- Land Reclamation, Landslide Treatment-453
- Lined Waterway or Outlet-468
- Mulching-484
- Precision Land Forming-462
- Prescribed Grazing-528
- Residue and Tillage Management, No Till-329
- Residue and Tillage Management, Reduced Till-345
- Riparian Forest Buffer-391
- Riparian Herbaceous Cover-390
- Rock Barrier-555
- Row Arrangement-557
- Sediment Basin-350
- Stormwater Runoff Control-570
- Stream Habitat Improvement and Management-395
- Streambank and Shoreline Protection-580
- Stripcropping-585
- Subsurface Drain-606
- Surface Roughening-609
- Terrace-600
- Trails and Walkways-575
- Tree/Shrub Establishment-612
- Underground Outlet-620
- Upland Wildlife Habitat Management-645
- Vegetated Treatment Area -635
- Vegetative Barrier-601
- Water and Sediment Control Basin-638
- Watering Facility-614

## *E. coli*

*E. coli* entering surface waters from grazing and agricultural land uses can be minimized, eliminated, or mitigated through the implementation of agricultural BMPs. Riparian fencing, livestock watering systems that provide off-stream water supplies and/or disperse grazing throughout the landscape and other BMPs help reduce the amount of time livestock are in or near waterbodies, thus reducing their impacts. Grazing management and timing may also affect fecal bacteria from entering waterbodies due to runoff from seasonal precipitation events. Table 10 shows BMPs identified by NRCS as moderately to substantially effective at reducing pathogens, such as *E. coli*, from manure, bio-solids, or compost.

Table 10Table 9: BMPs and Practice Codes identified by NRCS as moderately to substantially effective for reducing soil erosion and sediment transported to surface waters

- |  |  |
|--|--|
| • Access Control -472                              | • Residue and Tillage Management, No Till-329      |
| • Alley Cropping-311                               | • Residue and Tillage Management, Reduced Till-345 |
| • Anionic Polyacrylamide (PAM) Erosion Control-450 | • Riparian Forest Buffer-391                       |
| • Conservation Cover-327                           | • Riparian Herbaceous Cover-390                    |
| • Conservation Crop Rotation-328                   | • Rock Barrier-555                                 |
| • Constructed Wetland-656                          | • Row Arrangement-557                              |
| • Contour Buffer Strips-332                        | • Sediment Basin-350                               |
| • Contour Orchard and Other Perennial Crops-331    | • Stormwater Runoff Control-570                    |
| • Cover Crop-340                                   | • Stream Habitat Improvement and Management-395    |
| • Critical Area Planting-342                       | • Streambank and Shoreline Protection-580          |
| • Cross Wind Ridges-588                            | • Stripcropping-585                                |
| • Cross Wind Trap Strips-589C                      | • Subsurface Drain-606                             |
| • Field Border-386                                 | • Surface Roughening-609                           |
| • Field Operations Emissions Reduction-376         | • Terrace-600                                      |
| • Filter Strip-393                                 | • Trails and Walkways-575                          |
| • Grassed Waterway-412                             | • Tree/Shrub Establishment-612                     |
| • Herbaceous Wind Barriers-603                     | • Underground Outlet-620                           |
| • Karst Sinkhole Treatment -527                    | • Upland Wildlife Habitat Management-645           |
| • Land Reclamation, Landslide Treatment-453        | • Vegetated Treatment Area -635                    |
| • Lined Waterway or Outlet-468                     | • Vegetative Barrier-601                           |
| • Mulching-484                                     | • Water and Sediment Control Basin-638             |
| • Precision Land Forming-462                       | • Watering Facility-614                            |
| • Prescribed Grazing-528                           |  |

### *E. coli*

*E. coli* entering surface waters from grazing and agricultural land uses can be minimized, eliminated, or mitigated through the implementation of agricultural BMPs. Riparian fencing, livestock watering systems that provide off-stream water supplies and/or disperse grazing throughout the landscape and other BMPs help reduce the amount of time livestock are in or near waterbodies, thus reducing their impacts. Grazing management and timing may also affect fecal bacteria from entering waterbodies due to runoff from seasonal precipitation events. Table 10 shows BMPs identified by NRCS as moderately to substantially effective at reducing pathogens, such as *E. coli*, from manure, bio-solids, or compost.

Table 10 shows BMPs identified by NRCS that are moderately to substantially effective at reducing soil erosion and minimizing sediment from entering surface waters.

**Table 9: BMPs and Practice Codes identified by NRCS as moderately to substantially effective for reducing soil erosion and sediment transported to surface waters**

- |  |  |
|--|--|
| • Access Control -472                              | • Residue and Tillage Management, No Till-329      |
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| • Anionic Polyacrylamide (PAM) Erosion Control-450 | • Riparian Forest Buffer-391                       |
| • Conservation Cover-327                           | • Riparian Herbaceous Cover-390                    |
| • Conservation Crop Rotation-328                   | • Rock Barrier-555                                 |
| • Constructed Wetland-656                          | • Row Arrangement-557                              |
| • Contour Buffer Strips-332                        | • Sediment Basin-350                               |
| • Contour Orchard and Other Perennial Crops-331    | • Stormwater Runoff Control-570                    |
| • Cover Crop-340                                   | • Stream Habitat Improvement and Management-395    |
| • Critical Area Planting-342                       | • Streambank and Shoreline Protection-580          |
| • Cross Wind Ridges-588                            | • Stripcropping-585                                |
| • Cross Wind Trap Strips-589C                      | • Subsurface Drain-606                             |
| • Field Border-386                                 | • Surface Roughening-609                           |
| • Field Operations Emissions Reduction-376         | • Terrace-600                                      |
| • Filter Strip-393                                 | • Trails and Walkways-575                          |
| • Grassed Waterway-412                             | • Tree/Shrub Establishment-612                     |
| • Herbaceous Wind Barriers-603                     | • Underground Outlet-620                           |
| • Karst Sinkhole Treatment -527                    | • Upland Wildlife Habitat Management-645           |
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| • Precision Land Forming-462                       | • Watering Facility-614                            |
| • Prescribed Grazing-528                           |  |

(USDA-NRCS, 2020)

### *E. coli*

*E. coli* entering surface waters from grazing and agricultural land uses can be minimized, eliminated, or mitigated through the implementation of agricultural BMPs. Riparian fencing, livestock watering systems that provide off-stream water supplies and/or disperse grazing throughout the landscape and other BMPs help reduce the amount of time livestock are in or near waterbodies, thus reducing their impacts. Grazing management and timing may also affect fecal bacteria from entering waterbodies due to runoff from seasonal precipitation events. Table 10 shows BMPs identified by NRCS as moderately to substantially effective at reducing pathogens, such as *E. coli*, from manure, bio-solids, or compost.

**Table 10: BMPs and Practice Codes identified by NRCS as moderately to substantially effective for reducing pathogens in surface waters**

- |                           |                                 |
|---------------------------|---------------------------------|
| • Alley Cropping-311      | • Riparian Forest Buffer-391    |
| • Constructed Wetland-656 | • Riparian Herbaceous Cover-390 |
| • Filter Strip-393        | • Vegetated Treatment Area -635 |
| • Nutrient Management-590 |                                 |

(USDA-NRCS, 2020)

### Priority Areas

Priority areas were selected by the load reductions required to meet target pollutant loads identified in the TMDL (see Table 11). High priority areas are defined as requiring a load reduction of greater than 20%, medium priority areas as requiring a 20-10% reduction, and low priority as requiring less than 10 % reduction to meet target levels. Priority Areas for *E. coli* and Sediment on private lands utilized for range and agriculture are displayed in Table 11, Figure 8 and Figure 9.

East Side Soil and Water Conservation District (ESSWCD) explained in the quote below, the importance of protecting and improving water quality within Tincup Creek, Stump Creek, Crow Creek, and Rock Creek drainages vital for Yellowstone Cutthroat Trout (YCT).

“Tin Cup, Stump Creek, Crow Creek, and Rock Creek should be considered YCT strong-hold areas where high water quality condition is desired benefit to maintain healthy and robust populations of YCT for now and future generations to enjoy. These streams also provide critical spawning and habitat for the Salt River. If YCT populations decline in these areas that will have a direct effect of YCT populations in the Salt River itself.”(Matt Woodard, ESSWCD).

**Table 11: Priority Area Ranking by Necessary Reduction (%) to meet Target Loads**

ASSESSMENT UNIT	WATERBODY	POLLUTANT	NESESARY REDUCTION	PRIORITY
<i>ID17040105SK001_02b</i>	Newswander Canyon	Sediment	58%	High
<i>ID17040105SK003_02</i>	Tincup Creek / Grouse Creek /Trib.	Sediment	49%	High
<i>ID17040105SK003_02i</i>	Luthi Canyon	Sediment	20%	Medium
<i>ID17040105SK003_02j</i>	Haderlie Creek	Sediment	3%	Low
<i>ID17040105SK006_02g</i>	Stump Creek Trib./Graehl Canyon	Sediment	60%	High
<i>ID17040105SK006_04</i>	Lower Stump Creek	<i>E. coli</i>	72%	High
<i>ID17040105SK006_04</i>	Lower Stump Creek	Sediment	47%	High
<i>ID17040105SK007_02c</i>	Smoky Creek	<i>E. coli</i>	88%	High
<i>ID17040105SK007_02c</i>	Smoky Creek	Sediment	78%	High
<i>ID17040105SK007_03</i>	Tygee Creek	Sediment	55%	High
<i>ID17040105SK008_02c</i>	Beaver Dam Creek	Sediment	76%	High
<i>ID17040105SK008_04</i>	Crow Creek	<i>E. coli</i>	78%	High
<i>ID17040105SK008_04</i>	Crow Creek	Sediment	16%	Medium
<i>ID17040105SK011_03</i>	Rock Creek	Sediment	64%	High

Figure 8: Priority Areas - E. coli

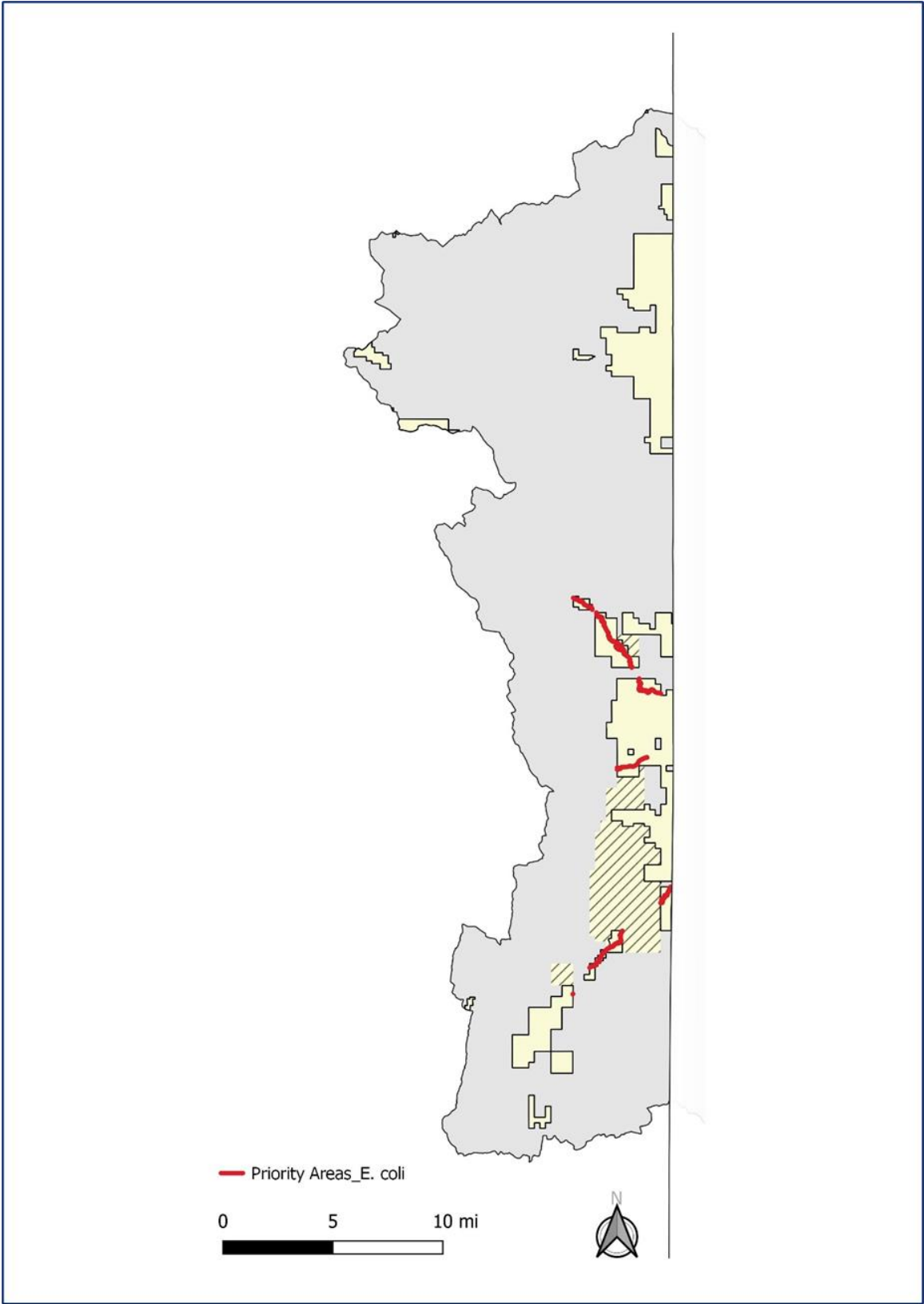
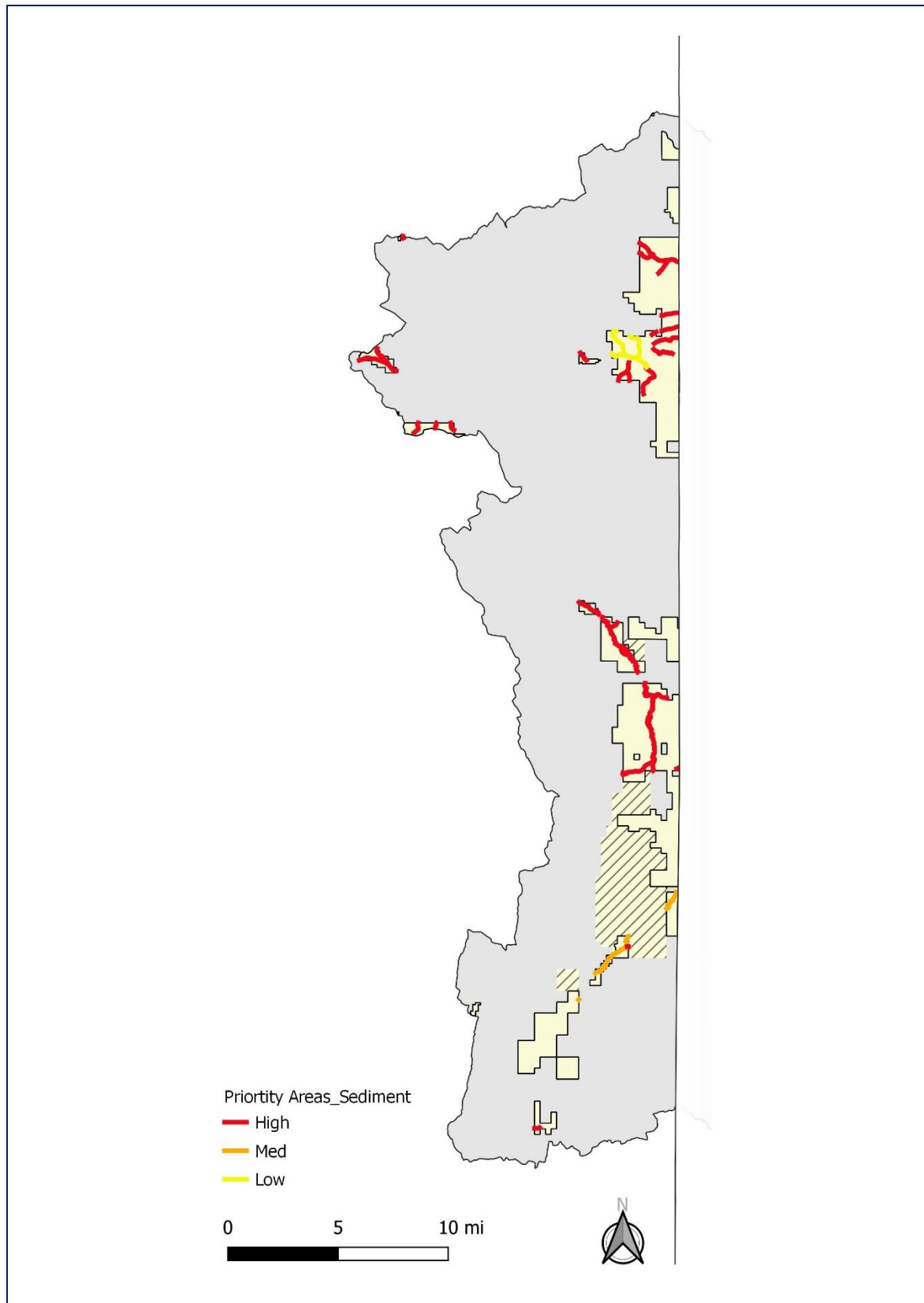




Figure 9: Priority Areas - Sediment



## Monitoring & Evaluation

### Agricultural BMP Implementation Monitoring

Monitoring of BMP implementation will depend greatly on funding sources and requirements. Monitoring may include grant reporting and documentation, conservation planning and construction checks, status reviews, 319 checks, annual conservation project tours, etc.

### Agricultural BMP Effectiveness Monitoring

BMP Effectiveness will consist of background water quality monitoring by DEQ through the Beneficial Use Reconnaissance Program (BURP) which is used to create subbasin assessments, develop water quality standards and criteria, populate data for the Idaho Integrated Report that shows the condition of all the state's waters (DEQ, 2020). Funding sources may include requirements such as photo monitoring, annual on-site visits, water testing, predictive modeling to show future benefits, etc. to show effectiveness. *Idaho Agricultural Best Management Practices – Field Guide for Evaluating BMP Effectiveness* (ISWCC, 2013) may be utilized to select appropriate evaluation methods and level of documentation by land use and BMP.

### Evaluation and Modification

Effectiveness of the Implementation Plan will be evaluated during the TMDL 5-year review process where BMP implementation data and monitoring data are cumulated and reviewed. This is when a determination of any modifications to the Implementation Plan will occur to ensure water quality standards and beneficial use criteria are met.

## Funding Sources

The following list identifies some funding sources available to private agricultural landowners. It is always recommended to contact the local Soil and Water Conservation District, USDA, or Idaho Soil and Water Conservation Commission offices for any updated funding opportunities for private landowners to implement agricultural BMPs to protect natural resources.

**Resource Conservation and Rangeland Development Program (RCRDP)** –The RCRDP is a low-interest loan program administered by the Idaho Soil and Water Conservation Commission (ISWCC) for implementation of agricultural and rangeland best management practices or loans to purchase equipment to increase conservation. These loans are a good way to get capital to start a project, especially in conjunction with other funding sources or grants that are reimbursement based.

<https://swc.idaho.gov/what-we-do/conservation-loans/>

**CWA 319** - These are Environmental Protection Agency (EPA) funds allocated to Tribal entities and the State of Idaho. The Idaho Department of Environmental Quality (DEQ) administers the Clean Water Act §319 Non-point Source Management Program for areas outside the Tribal Reservations. Funds focus on projects to improve water quality and are usually related to the TMDL process.

<https://www.deq.idaho.gov/water-quality/grants-loans/nps-319-subgrants/>

**General Fund Agricultural BMP Program** - These are funds appropriated by the Idaho State Legislature from the Idaho general fund to the Idaho Department of Environmental Quality (DEQ) to implement agricultural best management practices (BMPs) within Idaho

<https://www.deq.idaho.gov>

**Environmental Quality Incentives Program (EQIP):** EQIP provides financial and technical assistance to agricultural producers in order to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved or created wildlife habitat.

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/id/programs/financial/eqip/>

**Regional Conservation Partnership Program (RCPP)** - RCPP promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements.

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/id/programs/farmbill/rcpp/>

**The Agricultural Conservation Easement Program (ACEP)** – ACEP provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Agricultural Land Easements component, NRCS helps Indian tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the Wetlands Reserve Easements component, NRCS helps to restore, protect, and enhance enrolled wetlands.

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/id/programs/easements/acep>

**Conservation Technical Assistance (CTA)** –The CTA provides free technical assistance to help farmers and ranchers identify and solve natural resource problems on their farms and ranches. This might come as advice and counsel, through the design and implementation of a practice or treatment, or as part of an active conservation plan.

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/id/programs/?cid=stelprdb1142957>

**National Grazing Lands Coalition (NatGLC)** –The National Grazing Lands Coalition’ promotes ecologically and economically sound management of grazing lands. Grants are available that facilitate the following: (1) demonstration of how improved soil health affects grazing lands sustainability (2) establishment of conservation partnerships, leadership and outreach, (3) education of grazing land managers, professionals, youth and the public (4) enhancement of technical capabilities, and (5) improvement in the understanding of the values and multiple services that grazing lands provide.

<http://www.glci.org/>

**Conservation Reserve Program (CRP)** –The CRP is a land retirement program for blocks of land or strips of land that protect the soil and water resources, such as buffers and grassed waterways.

<https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/>

**Conservation Innovation Grants (CIG)** –CIG is a voluntary program to stimulate the development and adoption of innovative conservation approaches and technologies for agricultural production.

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/id/programs/financial/cig/>

**State Revolving Loan Funds (SRF)** –These funds are administered through the IDEQ.

<https://www.deq.idaho.gov/water-quality/grants-loans/water-system-construction-loans.aspx>

#### **Source Water Protection Grants**

Funding for projects to protect sources of public drinking water.

<https://www.deq.idaho.gov/water-quality/grants-loans/source-water-protection-grants/>

**Conservation Stewardship Program (CStP)** –CStP is a voluntary program that rewards the Nation's premier farm and ranch land conservationists who meet the highest standards of conservation environmental management.

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/id/programs/financial/csp>

**HIP** – This is an Idaho Department of Fish and Game program to provide technical and financial assistance to private landowners and public land managers who want to enhance upland game bird and waterfowl habitat. Funds are available for cost sharing on habitat projects in partnership with private landowners, non-profit organizations, and state and federal agencies.

<https://idfg.idaho.gov/conservation/habitat/hip>

**Partners Program in Idaho** – This is a U.S. Fish and Wildlife program providing funds for the restoration of degraded riparian areas along streams, and shallow wetland restoration.

<https://www.fws.gov/idaho/articles.cfm?id=149489623>

**ID Parks & Recreation** – The Idaho Department of Parks and Recreation provides a variety of funding programs and grants to government entities in Idaho for the provision of equipment and for the creation and renovation of outdoor recreational facilities. <https://parksandrecreation.idaho.gov/grants-and-funding>

**National Fish and Wildlife Foundation** – NFWF provides funding on a competitive basis to projects that sustain, restore, and enhance our nation's fish, wildlife, and plants and their habitats.

<http://www.nfwf.org/>

**Sustainable Agriculture Research and Education Grants** - Since 1988, SARE has funded more than 5,000 projects with grants for farmers, ranchers, extension agents and educators, researchers, nonprofits, students, communities, and others. SARE's mission is to advance—to the whole of American

agriculture—innovations that improve profitability, stewardship, and quality of life by investing in groundbreaking research and education. <https://www.westernsare.org/>

**Grants.gov** – Large database of federal grant opportunities for a wide variety of topics.  
[www.grants.gov](http://www.grants.gov)

## References

- DEQ. (2018). *Salt River Subbasin Assessment and Total Maximum Daily Loads*. Pocatello: DEQ.
- DEQ. (2020). *DEQ - Beneficial Use Reconnaissance Program*. Retrieved 2020, from <https://www.deq.idaho.gov/burp>
- ISWCC. (2013). *Idaho Agricultural Best Management Practices: Field Guide for Evaluating BMP Effectiveness* (Revised April 2013 ed.). (Resources Planning Unlimited, Inc., Ed.) Retrieved from [https://swc.idaho.gov/wp-content/uploads/sites/78/2019/08/bmp\\_april2013-sml.pdf](https://swc.idaho.gov/wp-content/uploads/sites/78/2019/08/bmp_april2013-sml.pdf)
- U.S. Census Bureau. (2019). *United States Census Bureau*. Retrieved from <https://www.census.gov>
- USDA-NRCS. (2020, April 4). *RMS Planning Tool - National*. Retrieved 2020, from NRCS Field Office Technical Guide (FOTG): <https://efotg.sc.egov.usda.gov>
- USGS. (2011). *NLCD 2011 Land Cover (2011 Edition)*. Sioux Falls, SD, USA: U.S. Geological Survey.